PROJECT CHARGE: 1706

PROJECT TITLE: TOBACCO PHYSICS

PROJECT LEADER: D. B. Losee

PERIOD COVERED: September 1 - 30, 1985

DATE OF REPORT: September 26, 1985

HEAT TRANSFER STUDIES (Waymack, Tiller, Losee)

The required heat removal for extinguishment of a freely smoldering cigarette is greater than the required heat removal for extinguishment of a cigarette in contact with a copper backed fabric. Furthermore, the highest temperature (thermocouple determined) achieved for this cigarette-fabric interface which is backed with copper is only 283°C. The static burn rate for this configuration is approximately 3.3 mm/min compared with the freely smoldering static burn rate of approximately 5 mm/min. This would indicate that the thermal inertia of the substrate has a feedback effect on the free smolder burn rate of cigarettes.

Mass burn rate studies are continuing on a variety of freely smoldering cigarette models. Preliminary indications are that there are not constant differences between calculated mass burn rates which are determined from static burn rate data and these directly determined mass burn rates. The significance of this finding is being pursued.

THERMAL ANALYSIS STUDIES (Tiller)

At Peter Martin's request the heat of vaporization of ℓ-menthol was determined. A value of 16.1 ± kcal/mole was determined by the Setaram DSC-111 which is in close agreement with a calculated value from vapor pressure-temperature data.

A weight loss study is being conducted on a black fibrous material. This material, a by-product of the laser processing of certain types of printed tipping paper, can reportedly catch on fire.

EXTRACTED TOBACCO STUDIES (Kang)

During tube furnace pyrolysis water extracted tobacco decomposes to produce significantly more selected condensed ring aromatic compounds than an equal weight of supercritical CO_2 extracted tobacco. This is despite a nearly 50% reduction in tobacco weight after water extraction compared with less than a 10% weight reduction with supercritical CO_2.

/ev

2001116402

Source: https://www.industrydocuments.ucsf.edu/docs/mfgm0000